USB-Wifi 驱动移植（FS_4412）

FS_4412 可以同链接 USB-Wifi 模块实现无线上网功能，本章节主要描述了如何在 FS_4412 开发板上移植 USB-Wifi 模块的驱动和相关的 WPA 加密工具。

1.获取 RT2780 驱动

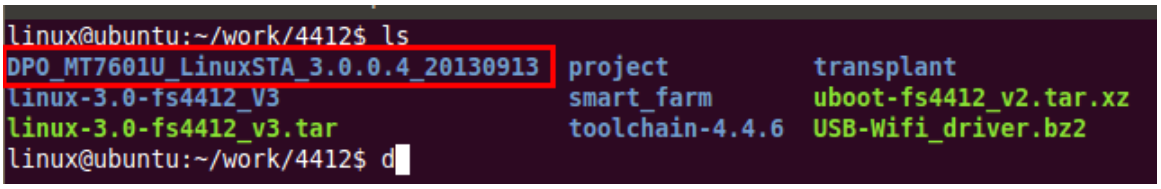
我们采用的 USB-Wifi 模块使用的是 RT2780 芯片，相关的驱动源码在\Cortex-A9\移植部分\Wifi 目录下的 USB-Wifi_driver。或者从官方自行下载，进入网址 http://www.mediatek.com/en/downloads/下载所需的驱动

将 USB-Wifi_driver 拷贝到工作目录中。

解压驱动源码包

```
tar -jxvf USB-Wifi_driver.bz2
```

解压完后可以看到目录 DPO_MT7601U_LinuxSTA_3.0.0.4_20130913



2. 移植 RT2780 驱动

2.1 修改 Makefile

2.1.1 修改 DPO_MT7601U_LinuxSTA_3.0.0.4_20130913 目录下的 Makefile

vi Makefile

修改 49 行中的

#PLATFORM = SMDK

为

PLATFORM = SMDK

改前如下图所示

```
46 #PLATFORM = CMPC
47 #PLATFORM = RALINK_2880
48 #PLATFORM = RALINK_3052
49 #PLATFORM = SMDK
50 #PLATFORM = RMI
51 #PLATFORM = RMI_64
52 #PLATFORM = KODAK_DC
53 #PLATFORM = DM6446
```

改后如下图所示：

```
47 #PLATFORM = RALINK_2880
48 #PLATFORM = RALINK_3052
49 PLATFORM = SMDK
50 #PLATFORM = RMI
51 #PLATFORM = RMI_64
52 #PLATFORM = KODAK_DC
53 #PLATFORM = DM6446
```

2.1.2 在 275 行，修改 linux 源码目录和交叉工具链

```
275 ifeq ($(PLATFORM),SMDK)
276 LINUX_SRC = /home/bhushan/itcenter/may28/linux-2.6-samsung
277 CROSS_COMPILE = /usr/local/arm/4.2.2-eabi/usr/bin/arm-linux-
278 endif
```

改为

```
275 ifeq ($(PLATFORM),SMDK)
276 LINUX_SRC = /home/linux/work/4412/linux-3.0-fs4412_V3
277 CROSS_COMPILE = arm-cortex_a8-linux-gnueabi-
278 endif
```

修改前如图：

```
274 ifeq ($(PLATFORM),SMDK)
275 LINUX_SRC = /home/bhushan/itcenter/may28/linux-2.6-samsung
276 CROSS_COMPILE = /usr/local/arm/4.2.2-eabi/usr/bin/arm-linux-
277 endif
278
```

修改后如图：

```
275 ifeq ($(PLATFORM),SMDK)
276 LINUX_SRC = /home/linux/work/4412/linux-3.0-fs4412_V3
277 CROSS_COMPILE = arm-cortex_a8-linux-gnueabi-
278 endif
```

2.1.3 修改 include/rtmp_def.h 文件中第 1604 行

```
1602 #define INF_MBSSID_DEV_NAME      "wlan"
1603 #else
1604 #define INF_MAIN_DEV_NAME        "ra"
1605 #define INF_MBSSID_DEV_NAME      "ra"
1606 #endif /* ANDROID_SUPPORT */
1607 #define INF_WDS_DEV_NAME         "wds"
```

将上图中 1604 行和 1605 行中的 ra 改成 wlan
改完如下图所示：

```
1603 #else
1604 #define INF_MAIN_DEV_NAME        "wlan"
1605 #define INF_MBSSID_DEV_NAME      "wlan"
1606 #endif /* ANDROID_SUPPORT */
```

2.1.4 查看 os/linux/config.mk 文件

确保 config.mk 文件中 WPA_SUPPLICANT 配置如下图所示。

```
24 # Support Wpa_Supplicant
25 # i.e. wpa_supplicant -Dralink
26 HAS_WPA_SUPPLICANT=y
27
28
29 # Support Native WpaSupplicant for Network Maganger
30 # i.e. wpa_supplicant -Dwext
31 HAS_NATIVE_WPA_SUPPLICANT_SUPPORT=y
32
```

3 编译源码

在 DPO_MT7601U_LinuxSTA_3.0.0.4_20130913 目录下执行以下命令编译源码

```
make clean
make -j2
```

编译成功后如下图所示

```
  CC [M]  /home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/../../os/linux/usb_main_dev.o
  CC [M]  /home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/../../common/rtusb_dev_id.o
/home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/../../os/linux/usb_main_dev.c: In function 'rt2870_suspend':
/home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/../../os/linux/usb_main_dev.c:394: warning: unused variable 'net_
dev'
/home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/../../os/linux/usb_main_dev.c: In function 'rt2870_resume':
/home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/../../os/linux/usb_main_dev.c:450: warning: unused variable 'net_
dev'
  CC [M]  /home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/../../common/frq_cal.o
/home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/../../common/frq_cal.c: In function 'InitFrequencyCalibration':
/home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/../../common/frq_cal.c:88: warning: format '%x' expects type 'uns
igned int', but argument 4 has type 'ULONG'
/home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/../../common/frq_cal.c: In function 'FrequencyCalibrationMode':
/home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/../../common/frq_cal.c:130: warning: unused variable 'PreRFValue'
  LD [M]  /home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/mt7601Usta.o
  Building modules, stage 2.
  MODPOST 1 modules
  CC      /home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/mt7601Usta.mod.o
  LD [M]  /home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/mt7601Usta.ko
make[1]: Leaving directory `/usr/src/linux-headers-2.6.32-38-generic'
cp -f /home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/mt7601Usta.ko /tftpboot 2>/dev/null || :
linux@ubuntu:~/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913$
```

其中生成的 **mt7601Usta.ko** 文件即是我们所需要的驱动程序

```
  LD [M]  /home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/mt7601Usta.o
  Building modules, stage 2.
  MODPOST 1 modules
  CC      /home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/mt7601Usta.mod.o
  LD [M]  /home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/mt7601Usta.ko
make[1]: Leaving directory `/usr/src/linux-headers-2.6.32-38-generic'
cp -f /home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/mt7601Usta.ko /tftpboot
```

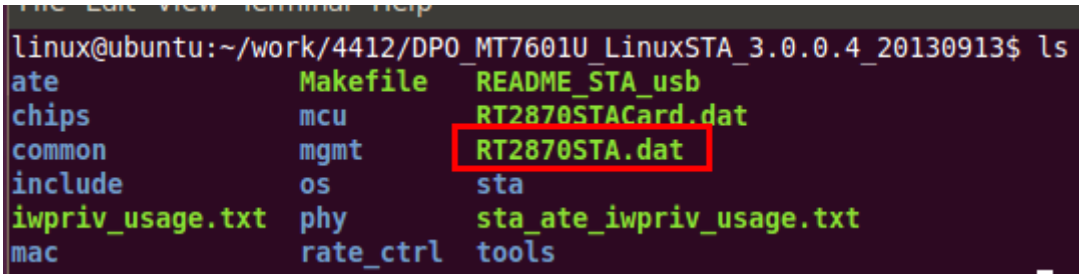
将/home/linux/work/4412/DPO_MT7601U_LinuxSTA_3.0.0.4_20130913/os/linux/mt7601Usta.ko 拷贝我们的根文件系统中（开发板的根文件系统）。

4.拷贝所需的数据文件 RT2870STA.dat

在**开发板的根文件系统**中创建目录**/etc/Wireless/RT2870STA/** *（注意，此目录为开发板的根文件系统）*

```
mkdir etc/Wireless/RT2870STA/ -p
```

将源码目录中的 RT2870STA.dat（如下图所示）拷贝到刚才创建的 **etc/Wireless/RT2870STA/**目录中

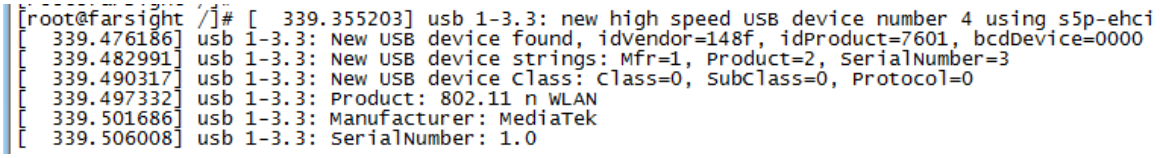


5.测试

请确保以上几步已经完成

5.1 插上 USB-Wifi 模块

将 USB-Wifi 模块插到开发板的 USB 接口上，可以在端口上看到如下打印信息



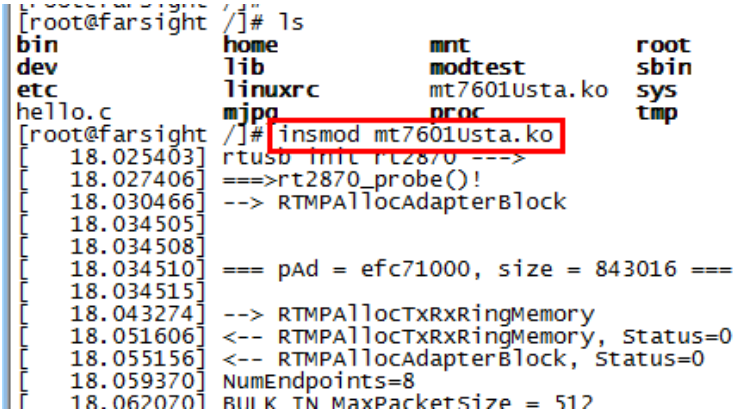
5.2 加载 USB-Wifi 模块

加载驱动程序 mt7601Usta.ko

在开发板上执行以下命令

```
insmod mt7601Usta.ko
```

加载过程如下图所示



加载成后如下如所示

```
[    18.165108] NVM is EFUSE
[    18.167325] Efuse Size=0x1d [Range:1e0-1fc]
[    18.171593] Endpoint(8) is for In-band Command
[    18.176033] Endpoint(4) is for WMM0 AC0
[    18.179846] Endpoint(5) is for WMM0 AC1
[    18.183673] Endpoint(6) is for WMM0 AC2
[    18.187476] Endpoint(7) is for WMM0 AC3
[    18.191293] Endpoint(9) is for WMM1 AC0
[    18.195112] Endpoint(84) is for Data-In
[    18.198936] Endpoint(85) is for Command Rsp
[    18.203116] Allocate a net device with private data size=0!
[    18.208691] Allocate net device ops success!
[    18.212911] The name of the new wlan interface is wlan0...
[    18.218396] RtmpOSNetDevAttach()--->
[    18.227916] <---RtmpOSNetDevAttach(), ret=0
[    18.230643] <===rt2870_probe()!
[    18.235089] usbcore: registered new interface driver rt2870
```

5.3 配置 wlan0 网络

在开发板上执行以下命令

```
ifconfig wlan0 up
```

```
[root@farsight /]#
[root@farsight /]# ifconfig wlan0 up
[    63.211343] WlanFunCtrl.word = 0xff200003
[    63.214238] MACVersion = 0x76010500
[    63.217615] Allocate 8192 memory for BA reordering
[    63.222246] MAC[Ver:Rev=0x76010500]
[    63.225633] USBLoadFirmwareToAndes
[    63.234983] FW Version:0.1.00 Build:7640
[    63.237433] Build Time:201302052146____
[    63.241249] ILM Length = 45380(bytes)
[    63.244912] DLM Length = 0(bytes)
[    63.251835] Loading FW....
[    63.315139] #
[    63.320428] USBLoadFirmwareToAndes: COM_REG0(0x730) = 0x1
```

通过 ifconfig 命令查看网络设备信息

如果前面步骤都成功，则应该出现类似下图所示的情况

```
[    64.579892] RTMPDrvOpen(2):Check if PDMA is idle!
[    64.584876] ==>  DMAIdle, GloCfg=0x40000050
[root@farsight /]# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:09:C0:FF:EC:48
          inet addr:192.168.8.200  Bcast:192.168.8.255  Mask:255.255.255.0
          inet6 addr: fe80::209:c0ff:feff:ec48/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:12288 errors:0 dropped:0 overruns:0 frame:0
          TX packets:4184 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:17401973 (16.5 MiB)  TX bytes:685660 (669.5 KiB)
          Interrupt:102 Base address:0x8000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

wlan0     Link encap:Ethernet  HWaddr 00:22:C0:CC:06:21
          inet6 addr: fe80::222:c0ff:fecc:621/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:2402 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:592385 (578.5 KiB)  TX bytes:0 (0.0 B)

[root@farsight /]#
```